Death Valley Dust Storm of February 13, 2012

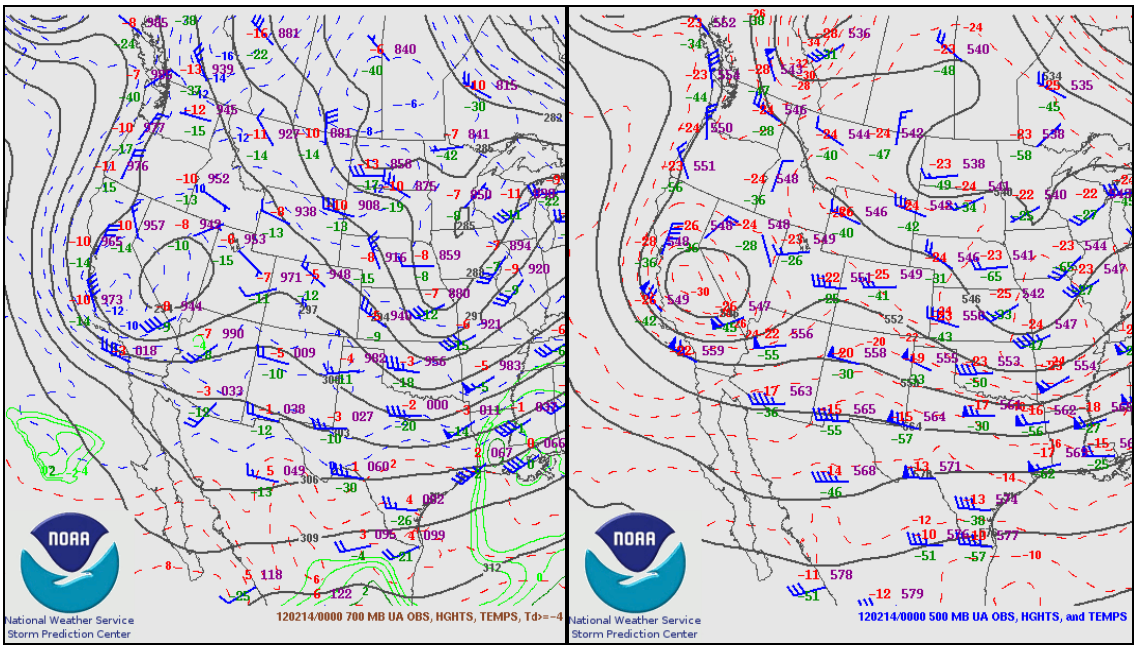
Photo of the dust storm moving south in Death Valley, looking west from near the Furnace Creek Inn. Photo credit: Naomi McGraw/National Park Service.

A large dust storm descended on Death Valley, California on the afternoon of February 13, 2012. Dust storms are not uncommon in Death Valley, as several occur each year. However, this storm was noted for its size as well as its speed. According to longtime Park Ranger Alan Van Valkenburg, this dust storm was the fastest moving he has seen in the last twenty years. Cheryl Chipman, Public Information Officer for the park, described the event as “one of a kind”.

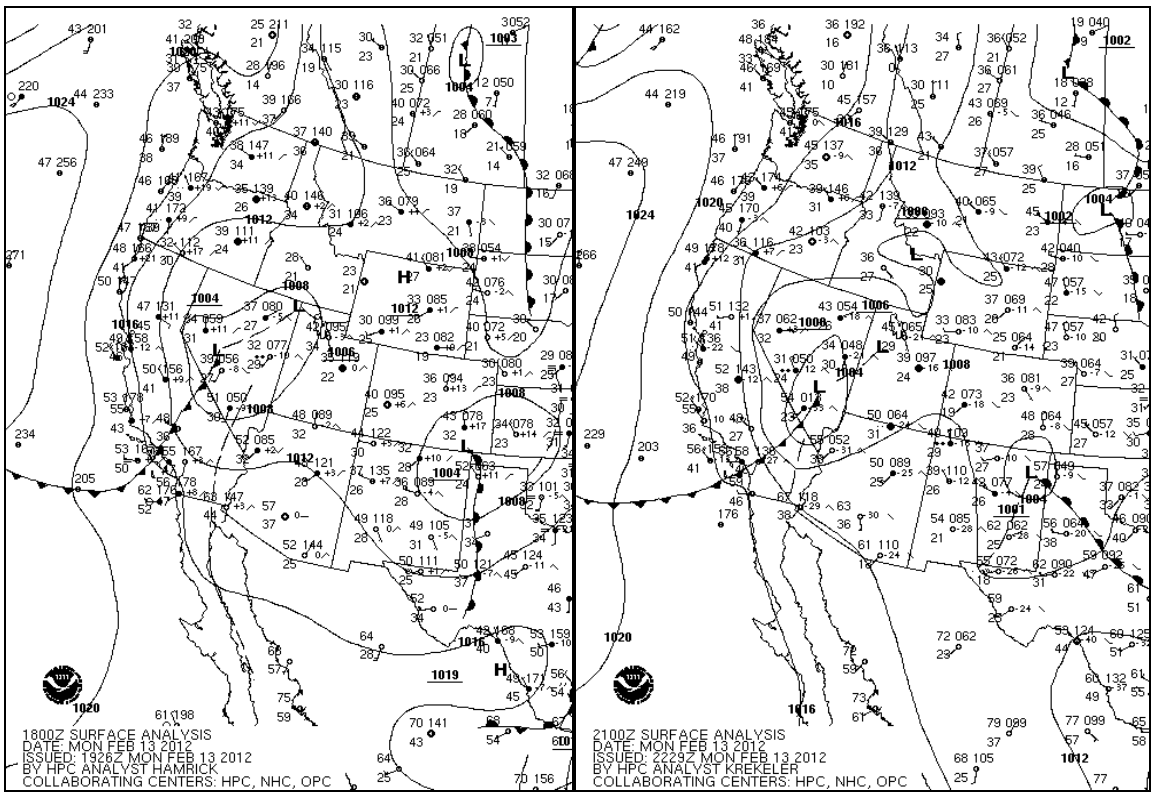
A mid-level low and associated surface cold front moved across the Mojave Desert in the afternoon hours of February 13th (Figures 1a&1b and 2a&b). Winds behind the front increased from the north around the time that the dust storm moved south across Death Valley, which was reported by the National Park Service (NPS) to be between 1 and 2 PM PST at the Furnace Creek Visitor Center. No official wind speeds were obtained in the valley before or during the duration of the dust storm. There was no detectable evidence of the dust storm from MODIS visible satellite imagery (Figure 4).

Based on videos and photographs obtained online after the event, the plume of dust raced south across the valley with the leading edge of the dust taking on a cloudlike appearance classically associated with a haboob. The word haboob means an intense dust storm. Although haboobs are typically associated with convective activity, typically trigged from thunderstorm downdrafts or outflow boundaries, they can also occur as a result of strong winds associated with a significant synoptic scale feature, in this case, a cold front. Visibility within the dust storm dropped to ¼ mile according to NPS estimates. Sand was deposited to the depth of an inch in the parking lot of the Furnace Creek Visitor Center according to NPS officials. Fortunately no damage or injuries were reported.

While sporadic instances of dust storms have been recorded by weather observers over the years in Death Valley, there is no definitive record of how this ranks in the historical perspective of dust storms in Death Valley. While winds were strong with this event based on nearby observations and based on values obtained from the 00Z February 14th radiosonde released at the National Weather Service Office in Las Vegas, what appears to be the largest contributing factor to this dust storm was the very dry conditions present across the area in the recent months. From October 1st through February 12th, only 0.06 inch of precipitation was recorded at the Furnace Creek Visitor Center, which ranks as the 12th driest such period on record dating back to 1911. Rain has not only been sparse at the Visitor Center but also in the surrounding area as well. Precipitation in and around Death Valley over the last 180 days has been 10 percent or less of normal (Figure 5). This has resulted in sand and soils in the area being drier and more conducive to being picked up by the wind and blown around.



Figures 1a and 1b – 700 mb and 500 mb maps of observed upper air data at 00Z on February 14th showing a mid-level low over southern Nevada.



Figures 2a and 2b – HPC Surface Analysis Maps at 18Z and 21Z for February 13, 2012 showing the western United States. Note the cold front that passes over Death Valley in this time frame.

Figure 3 - Photo of the dust storm at the Furnace Creek Visitor Center. Photo credit: Naomi McGraw/National Park Service.

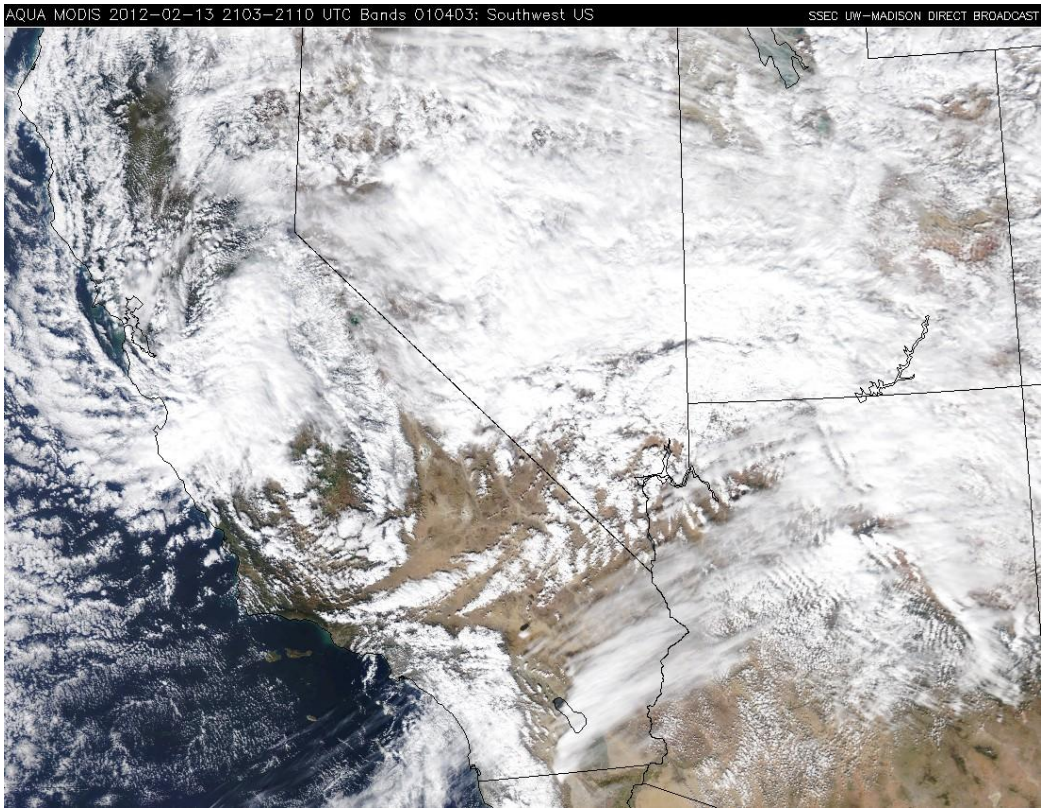


Figure 4 – MODIS Aqua Visible Satellite image on February 13, 2012 from 2103Z-2110Z at the time the dust storm began in Death Valley. Clear conditions can be noted over Death Valley, indicative of strong subsidence.

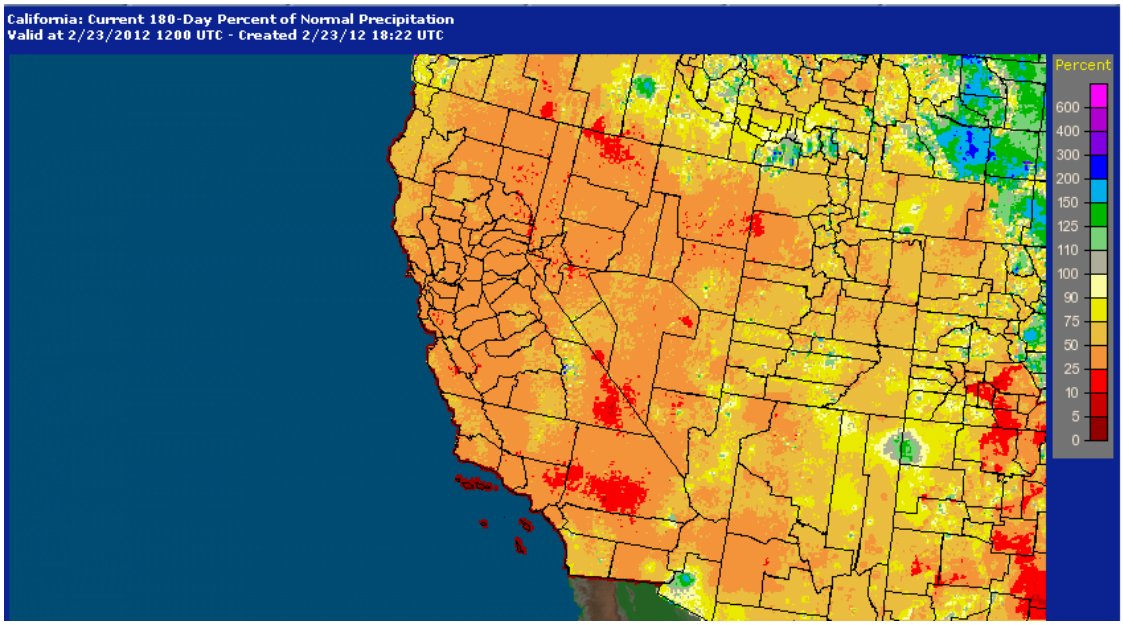


Figure 5 – 180 day percent t of normal precipitation values over California. The red colored areas in and near Death Valley indicate 10 percent or less of normal precipitation in this time period.